

Remarks/Arguments:

Claims 1-36 and 38-41 are pending and stand rejected.

By this amendment, claims 1-2, 5, 12, 14, 17, 19, 26, 28, 30-32, 35-36 and 38 are amended.

No new matter is presented by the claim amendments. Support for the claim amendments can be found throughout the original specification and, for example, in the original specification at paragraphs [0035], [0038] and [0043].

Rejection of Claims 1-35 and 38-41 under 35 U.S.C. §112, first paragraph.

In the Office Action, at item 5, claims 1-35 and 38-41 are rejected under 35 U.S.C. §112, first paragraph, as failing to comply with the written description requirement.

In this Office Action, at pages 2 and 3, the Examiner contends that "portions of the first and second image data are selectively blocked at each respective image module to synchronize the first and second image data received by the circuitry on the substrate in independent claims 1, 17 and 38 are not described or shown in originally filed specification" and that similar subject matter in independent claim 31 is also not described or shown in the originally filed specification.

This ground of rejection is respectively traversed.

The original specification discloses at paragraph [0038] that "[d]uring the WOD [(window of disinterest)], each camera module tri-states its image data bus at the same time the other image module outputs its image data during its WOI [(window of interest)]. As a result, a composite image data stream is generated on the shared tri-state data bus," (brackets added). That is, one of ordinary skill would understand that when a camera module tri-states its data bus the output of the camera module is effectively disconnected from the image data bus via a high impedance and, thus, is selectively blocked as provided in independent claims 1, 17, 31 and 38. For expediency of prosecution, Applicant has amended these independent claims to clarify, for example, "at the first image module, a portion of the first image data is selectively blocked by tri-stating a connection between the first image module and the common data line during a first period and at a second image module, a portion of the second image data is selectively blocked by tri-stating a connection between the second image module and the common data line during a second time period," as required by claim 1 and similarly by claims 17, 31 and 38.

Applicant submits that claims 1, 17 and 38 are fully supported by the original specification and, in particular, paragraph [0038].

Rejection of Claims 31 and 38 under 35 U.S.C. §103(a).

In the Office Action, at item 4, claims 31 and 38 are rejected under 35 U.S.C. §103(a) as being patentable over Beckett (U.S. Patent No. 5,852,502).

Reconsideration is respectfully requested.

Claim 31

Claim 31 is directed to an electronic apparatus, and recites:

the first image module adopted to capture a first image with a first orientation in a first direction, and mounted on said substrate;

a second image module adopted to capture a second image with a second orientation in either the first direction or in a second direction and mounted on said substrate...

wherein, at the first image module, a portion of the first captured image is selectively blocked by tri-stating an output thereof during a first time period and at a second image module, a portion of the second captured image is selectively blocked by tri-stating an output thereof during a second time period, the first and second time periods being consecutive time periods to synchronize the first and second captured images receive by circuitry on the substrate to generate a composite image of at least one portion of each of the first and second images on the screen.

Beckett Reference

Beckett discloses a camera 12 that includes camera lens 18 and allows the viewing of an object to obtain an image. The camera lens 18 is optically connected to a beam splitter 20 which directs a first beam 28 to a monochrome sensor 22 and directs a second beam 30 to a color sensor 24. (See Beckett at Column 4, lines 1-9.) That is, in Beckett the monochrome and color sensors 22 and 24 share a lens 18 and are in a common orientation. Moreover, Beckett discloses that the monochrome and color sensors 22 and 24 may be used together such that a composite pixel is generated from the gray scale value of a monochrome pixel and the yield of saturation values for a corresponding color pixel. (See Beckett at column 3, lines 8-10.) In Beckett, a plurality of processors calculate gray scale, yield and saturation for the composite high resolution frame in parallel for real time viewing of the composite images. (See Beckett at column 3, lines 29-33.) That is, Beckett teaches the generation of a composite image which is combined on a pixel-by-pixel basis from monochrome pixels of the monochrome sensor 22 and color pixels of the color sensor 24 to generate composite pixels, which are different from the

original monochrome or color pixels. Thus, Beckett does not contemplate the generation of "a composite image of at least one portion of each of the first and second images on the screen," as required by claim 31. Moreover, because Beckett generates the composite image on a pixel-by-pixel basis, it does not block a portion of the first captured image during a first time period and does not block a portion of the second captured image during a second time period (consecutive with the first time period) to generate the composite image.

Accordingly, it is submitted that claim 31 patentably distinguishes over Beckett for at least the above-mentioned reasons.

Claim 38

Claim 38, which includes similar but not identical features to those of claim 31, is submitted to patentably distinguish over Beckett for at least the same reasons as claim 31.

Rejection of Claims 36 and 38-40 under 35 U.S.C. §103(a)

In the Office Action, at item 5, claims 36 and 38-40 are rejected under 35 U.S.C. §103(a) as being unpatentable over Monroe (U.S. Patent No. 7,057,647).

Reconsideration is respectfully requested.

Claim 36

Claim 36 is directed to a method of operating an electronic apparatus having first and second image modules, and recites:

first capturing a scene by the first image module while the second image module is turned off;

previewing the scene on a display;

tuning on the second image module after the capturing of the scene by the first image module, and

second capturing, immediately after the turning on of the second image module, the scene at a higher resolution than the previewed scene using the second image module based on the previewed scene such that fixed pattern noise in the second captured scene when the second image module had been turned off during the first capturing of the scene is reduced relative to the fixed pattern noise in the second captured scene if the second module had been turned on during the first capturing of the scene.

Monroe Reference

Monroe discloses a system having multiple digital imagers on 100, 102, and 104 that share a common address bus 108 and data bus 106. A camera selection signal 110 is applied to multiplexer 112 to select one of the sensors via enable lines 114, 116 and 118. Monroe is

silent regarding details of the multiple digital imagers 100, 102 and 104 and, in particular, does not disclose or suggest that any of the multiple digital imagers 100, 102 and 104 are turned off during the capture of a scene by another digital imager 100, 102 or 104. Moreover, Monroe is silent regarding anything related to fixed pattern noise and, more particularly, that the "fixed pattern noise in the second captured scene when the second image module has been turned off during the first capturing of the scene is reduced relative to the fixed pattern noise in the second captured scene if the second image module has been turned on during the first capturing of the scene, as required by claim 36." This is because, for example, the imagers of Monroe are designed to respond to bus commands and thus, are not turned off during times of non-operation (i.e., while not capturing images).

Accordingly, it is submitted that claim 36 patentably distinguishes over Monroe for at least the above-mentioned reasons.

Claim 38

Claim 38 is directed to a method of operating an electronic apparatus, the electronic apparatus including first and second image modules having first and second outputs, respectively, and recites:

capturing first and second scenes, as first and second data streams, using the first image module and the second image module, respectively ...

the synchronizing of the first and second image data includes tri-stating an output of the first image module during a first time period and tri-stating an output of the second image module during a second time period, the first and second time periods being consecutive time periods such that the first and second captured image data received by the circuitry on the substrate are synchronized to generate the composite image data stream including at least one portion of each of the first and second image data.

Monroe Reference

Monroe, similar to Beckett, discloses a common lens and a beam splitter 12 with a color sensor 14 and a monochrome sensor 16. (See, for example, Fig. 4 of Monroe.) Thus, contrary to the recitation in claim 38, Monroe captures only a single scene with the color sensor 14 and the monochrome sensor 16. Moreover, Monroe discloses that the monochrome and the color images may be produced simultaneously and fused algorithmically, yielding an improvement in sensitivity and color resolution compared with a conventional color camera. (See the Abstract of Monroe.) Monroe further discloses that the monochrome sensor 16 is used to provide scene

luminance information, while the color sensor 14 is used to provide chrominance information. Since luminance information is provided by sensor 16, non-traditional color filters on color sensors 14 may be used to increase its resolution and sensitivity. That is, the processor 30 may be used to scale and merge the two information streams into one signal (corresponding to the composite image data stream cited in claim 38). The one signal of Monroe, however, does not include at least one portion of each of the first and second image data. This is because, the one signal of Monroe is a fused image from the color sensor 14 and the monochrome sensor 16 on a pixel-by-pixel basis. Moreover, because Monroe fuses the two information streams, it does not use first image data from a first time period and second image data from a second time period (consecutive with the first time period) for the composite image data stream.

Accordingly, it is submitted that claim 38 patentably distinguishes over Monroe.

Claims 39- 40

Claims 39-40, which include all of the limitations of claim 38, are submitted to patentably distinguish over Monroe for at least the same reasons as claim 38.

Rejection of Claims 1-8, 10-11, 13-14, 17-22, 26-27, 30 and 41 under 35 U.S.C. §103(a)

In the Office Action, at item 7, claims 1-8, 10-11, 13-14, 17-22, 26-27, 30 and 41 are rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake (U.S. Patent Publication No. 2001/0050721) in view of Johnson (U.S. Patent Publication No. 2006/0197847) in further view of Larson (U.S. Patent Publication No. 2004/0252642).

Reconsideration is respectfully requested.

Claim 1 is directed to a dual camera module, and recite:

a first image module for capturing first image data of a first orientation of a first scene, and including a first output for transmitting the first image data to the circuitry on the substrate;

a second image module for capturing second image data of a second orientation of the first scene, different from the first orientation of the first scene, or a different scene, and including a second output for transmitting the second image data to the circuitry on the substrate...

wherein, at the first image module, a portion of the first image data is selectively blocked by tri-stating a connection between the first image module and the common data line during a first time period and at the second image module, a portion of the second image data is selectively blocked by tri-stating a connection between the second image module and the common data line during a second time period, the first and second time periods

being consecutive time periods to synchronize the first and second image data received by the circuitry on the substrate to generate a composite image that includes at least one portion of each of the captured first and second image data.

Miyake and Johnson References

In the Office Action, at page 8, the Examiner acknowledges that Miyake and Johnson fail to explicitly disclose "portions of first and second image data are selectively blocked at each respective image module to synchronize the first and second image data received by the circuitry on the substrate." Applicant agrees with the Examiner's acknowledgement. Applicant further submits that Miyake and Johnson do not disclose or suggest the tri-stating of a connection between a first image module and a common data line, the tri-stating of a connection between the second image module and the common data line or the generation of a composite image that includes at least one portion of each of the captured first and second image data.

Larson Reference

In the Office Action, at page 9, the Examiner contends that Larson teaches "an apparatus for transmitting data from a first and second I2C source port buffer (abstract)," and also teaches "a step for transmitting the data from the first I2C source port buffer to the I2C destination port while restricting transmission from [sic] the second I2C source port buffer to the I2C destination port (Fig. 9; step 903; [0103-0106])." Although, Larson discloses an I2C router 900, Larson is silent regarding "tri-stating a connection between the first image module and the common data line during a first time period and ... tri-stating a connection between the second image module and the common data line during a second period, the first and second time periods being consecutive time periods to synchronize the first and second image data received by the circuitry on the substrate to generate a composite image that includes at least one portion of each of the captured first and image data," as required by claim 1. This is because, Larson which is concerned with methods of overflow recovery with I2C packets on an I2C router does not contemplate the timing of image data to generate a composite image that includes at least one portion of each of the captured first and second image data.

Accordingly, it is submitted that claim 1 patentably distinguishes over Miyake in view of Johnson in further view of Larson for at least the above-mentioned reasons.

Claim 17

Claim 17, which includes similar but not identical features to those of claim 1, is submitted to patentably distinguish over Miyake in view of Johnson in further view of Larson for at least the same reasons as claim 1.

Claims 2-8, 10-11, 13-14, 18-22, 26-27, 30 and 41 which include all of the limitations of claim 1 or claim 17, are submitted to patentably distinguish over Miyake in view of Johnson in further view of Larson for at least the same reasons as claim 1 or claim 17.

Rejection of Claims 31-35 under 35 U.S.C. §103(a)

In the Office Action, at item 8, claims 31-35 are rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Larson.

Reconsideration is respectfully requested.

Claim 31, which includes similar but not identical features to those of claim 1, is submitted to patentable distinguish over Miyake in view of Larson for at least similar reasons to those of claim 1.

Claims 32-35

Claims 32-35, which include all of the limitations of claim 31, are submitted to patentably distinguish over Miyake in view in view of Larson for at least the same reasons as claim 31.

Rejection of Claim 12 under 35 U.S.C. §103(a)

In the Office Action, at item 9, claim 12 is rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson and Larson in further view of Kayada (U.S. Patent Publication No. 2004/0119718).

This rejection is respectfully traversed.

Kayada is not prior art against the present application. More particularly, the present application was filed after November 29, 2000 and Kayada was filed, as a PCT application, on April 25, 2003 in the Japanese language. Thus, Kayada is not prior art under §102(e) because the PCT application was not filed in the English language. Moreover, the application date of August 29, 2003 of the present application predates the publication dates of all of the known foreign counterpart applications of Kayada and the PCT publication date of Kayada. (See enclosed listing of the patent family of Kayada).

Accordingly, the rejection of claim 12 is improper. Applicant respectfully requests the rejection to be withdrawn.

Rejection of Claims 9 and 23-24 under 35 U.S.C. §103(a)

In the Office Action, at item 10, claims 9 and 23-24 are rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson and Larson and further in view of Stam et al. (U.S. Patent Publication No. 2004/0230358, hereafter referred to as Stam).

Reconsideration is respectfully requested.

Claim 9 and 23-24, which include all of the limitations of claim 1 or claim 17, are submitted to patentably distinguish over Miyake in view of Johnson and Larson for at least the same reasons as claim 1 or claim 17.

The addition of Stam does not overcome the deficiencies of Miyake in view of Johnson and Larson. This is because, Stam, which is used by the Examiner to teach communication protocol of various bus structures, does not disclose or suggest the selectively blocked feature of claim 1. That is, Stam is silent regarding, for example, synchronization of first and second images using selective blocking and the generation of a composite image, as defined in claim 1 or claim 17.

Accordingly, it is submitted that claims 9 and 23-24, which includes all of the limitations of claim 1 or claim 17, patentably distinguish over Miyake in view of Johnson and Larson in further view of Stam for at least the above-mentioned reasons.

Rejection of Claim 25 under 35 U.S.C. §103(a)

In the Office Action, at item 11, claim 25 is rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson, Larson and Stam and further in view of Tanha (U.S. Patent Publication No.: 2002/0108011).

Reconsideration is respectfully requested.

Claim 25, which includes all of the limitations of claim 17, is submitted to patentably distinguish over Miyake in view of Tanha for at least the same reasons as claim 17.

The addition of Tanha does not overcome the deficiencies of Miyake, Johnson, Larson and Stam. This is because, Tanha is silent regarding anything related to the selectively blocked feature of claim 1. That is, for example, Tanha does not discuss blocking of first and second captured images. Instead, Tanha is concerned with an electronic device that includes a dual interface serial bus that can support either the I2C or SPI serial interfaces. (See Tanha at [0009].)

Accordingly, it is submitted that claim 25, which includes all of the limitations of claim 17, is submitted to patentably distinguish over Miyake, Johnson, Larson and Stam in further view of Tanha for at least the above-mentioned reasons.

Rejection of Claim 15 under 35 U.S.C. §103(a)

In the Office Action, at item 12, claim 15 is rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson and Larson in further view of Monroe.

Reconsideration is respectfully requested.

Claim 15, which includes all of the limitations of claim 1, is submitted to patentably distinguish over Miyake, Johnson and Larson for at least the same reasons as claim 1.

The addition of Monroe does not overcome the deficiencies of Miyake. This is because, Monroe does not disclose the selectively blocked feature of claim 1. Instead, Monroe discloses the use of, for example, a color image sensor 4 and an image sensor 8 and a switch 18. Switch 18 is used to select the appropriate sensor output. Moreover, the selected sensor output signal 22 is optionally displayed on viewfinder 20. (See Monroe at Col. 6, lines 10-15.) In another embodiment, the Monroe system includes multiple digital imagers 100, 102 and 104 sharing a common address bus 108 and data bus 106. A camera selection signal 110 is applied to multiplexer 112 to select one of the sensors via lines 114, 116 and 118, to allow for a desired camera. Monroe, however, does not disclose or suggest the selectively blocked feature of claim 1. That is, Monroe does not disclose anything related to synchronization of the first and second image data received by circuitry on any substrate or that "a composite image includes at least on portion of each of the captured first and second image data," as required by claim 1.

Accordingly, it is submitted that claim 15, patentably distinguishes over Miyake in view of Johnson and Larson in further view of Monroe for at least the above-mentioned reasons.

Rejection of Claims 16 and 29 under 35 U.S.C. §103(a)

In the Office Action, at item 13, claims 16 and 29 are rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson and Larson in further view of Kuroda.

Reconsideration is respectfully requested.

Claims 16 and 29, which include all of the limitations of claim 1 or claim 17, are submitted to patentably distinguish over Miyake, Johnson and Larson for at least the same reasons as claim 1 or claim 17.

The addition of Kuroda does not overcome the deficiencies of Miyake, Johnson and Larson. This is because, Kuroda does not disclose or suggest the selectively blocked feature of claim 1 and similarly for claim 17. Instead, Kuroda merely discloses that a user can select between a close-range-photography camera module 6 and a long-range camera module 10 to capture a photograph. (See Kuroda at paragraph [0035] and [0044].)

Accordingly, claims 16 and 29, which include all of the limitations of claim 1 or claim 17, are submitted to patentably distinguish over Miyake in view of Johnson and Larson in further view of Kuroda for at least the same reasons as claim 1 or claim 17.

Rejection of Claim 28 under 35 U.S.C. §103(a)

In the Office Action, at item 14, claim 28 is rejected under 35 U.S.C. §103(a) as being unpatentable over Miyake in view of Johnson and Larson in further view of Wells et al. (U.S. Patent Publication No.: 2004/0179600, hereafter referred to as Wells).

Reconsideration is respectfully requested.

Claim 28, which includes all of the limitations of claim 17, is submitted to patentably distinguish over Miyake in view of Johnson and Larson for at least the same reasons as claim 17.

The addition of Wells does not overcome the deficiencies of Miyake, Johnson and Larson. This is because, Wells does not include the selectively blocked feature of claim 17. Instead, Wells discloses that an input circuit may be configured to generate a first intermediate signal from the plurality of input video signals. A storage circuit may be configured to (i) organize the first intermediate signal into a plurality of sequences each related to one of the input video signals and (ii) generate a second intermediate signal from the sequences. (See Wells at paragraph [0007].) More particularly, the input section 102 may multiplex one picture or frame from each of the video signals INPUT1 - INPUTk into the intermediate signal INT1. (See Wells at paragraph [0020].) That is, Wells discloses the use of multiplexing of signals, but is silent regarding selectively blocking of signals, for example. Moreover, Wells does not discuss the synchronization of "at least one portion of each of the captured of first and second images," as required by claim 17.

Accordingly, it submitted that claim 28, patentably distinguishes over Miyake in view of Johnson and Larson in further view of Wells for at least the above-mentioned reasons.

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MICR-155US

Conclusion

In view of the claim amendments and remarks, Applicant submits that the application is in condition for allowance, which action is respectfully requested.

Respectfully submitted,



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Enclosure: Patent Family of Kayada

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